

# Sela.

GCPDev

## Developing Applications with Google Cloud

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# Developing Applications with Google Cloud

GCPDev - Version: 1

 3 days Course

## Description:

Learn how to design, develop, and deploy applications that seamlessly integrate components from the Google Cloud ecosystem. This course uses lectures, demos, and hands-on labs to show you how to use Google Cloud services and pre-trained machine learning APIs to build secure, scalable, and intelligent cloud-native applications.

## Intended audience:

Application developers who want to build cloud-native applications or redesign existing applications that will run on Google Cloud Platform

## Prerequisites:

Completed Google Cloud Fundamentals or have equivalent experience; Working knowledge of Node.js, Java, or Python; Basic proficiency with command-line tools and Linux operating system environments.

## Objectives:

Describe best practices for cloud-native application development  
Differentiate between data storage options for various types of application data  
Implement a solution for storing non-relational application data in Datastore



Implement storage solution for objects (binary and large files) using Cloud Storage

## Topics:

### Best Practices for Application Development

- • Code and environment management
- • Design and development of secure, scalable, reliable, loosely coupled application
- components and microservices
- • Continuous integration and delivery
- • Re-architecting applications for the cloud
- Objectives
  - • Design and develop secure, scalable, reliable, loosely coupled application
  - components and microservices.
  - • Understand how to rearchitect applications for the cloud.
- Activities
  - Module quiz

### Overview of Data Storage Options

- • Overview of options to store application data
- • Use cases for Cloud Storage, Firestore, Cloud Bigtable, Cloud SQL, and Cloud Spanner
- • Demo: Connecting Securely to a Cloud SQL Database
- Objectives
  - Choose the appropriate data storage option for application data.
- Activities
  - 1 demo and 1 quiz

### Best Practices for Using Datastore



- • Best practices related to using Firestore in Datastore mode for:
  - • Queries
  - • Built-in and composite indexes
  - • Inserting and deleting data (batch operations)
  - • Transactions
  - • Error handling
  - • Demo: Explore Datastore
  - • Demo: Use Dataflow to Bulk-load Data into Datastore
  - • Lab: Storing Application Data in Datastore
- Objectives
  - Understand best practices related to queries, built in and composite indexes,
  - inserting and deleting data (batch operations), and transactions error handling.
- Activities.
  - 2 demos, 1 lab, and 1 quiz

## Performing Operations on Buckets and Objects

- • Cloud Storage concepts
- • Consistency model
- • Demo: Explore Cloud Storage
- • Request endpoints
- • Composite objects and parallel uploads
- • Truncated exponential backoff
- • Demo: Enable CORS Configuration in Cloud Storage
- • Understand Cloud Storage concepts.
- • Differentiate between strongly consistent and eventually consistent operations.
- • Access Cloud Storage through request endpoints.
- • Use object composition to upload an object in parallel.
- • Use truncated exponential backoff to deal with network failures.
- Objectives
  - • Understand Cloud Storage concepts.



- • Differentiate between strongly consistent and eventually consistent operations.
- • Access Cloud Storage through request endpoints.
- • Use object composition to upload an object in parallel.
- • Use truncated exponential backoff to deal with network failures.
- Activities
  - 2 demos and 1 quiz

## Best Practices for Using Cloud Storage

- • Naming buckets for static websites and other uses
- • Naming objects (from an access distribution perspective)
- • Performance considerations
- • Lab: Storing Image and Video Files in Cloud Storage
- Objectives
- Activities
  - 1 lab and 1 quiz

## Handling Authentication and Authorization

- • Identity and Access Management (IAM) roles and service accounts
- • User authentication by using Firebase Authentication
- • User authentication and authorization by using Identity-Aware Proxy
- • Lab: Adding User Authentication to your Application
- Objectives
  - Implement federated identity management.
- Activities
  - 1 lab and 1 quiz

## Using Pub/Sub to Integrate Components of Your Application



- • Topics, publishers, and subscribers
- • Pull and push subscriptions
- • Use cases for Pub/Sub
- • Lab: Developing a Backend Service
- Objectives
  - • Understand Pub/Sub topics, publishers, and subscribers.
  - • Understand pull and push subscriptions.
  - • Explore use cases for Pub/Sub.
- Activities
  - 1 lab and 1 quiz

## Adding Intelligence to Your Application

- Overview of pre-trained machine learning APIs such as the Vision API and the Cloud
- Natural Language Processing API
- Objectives
  - Explore pre-trained machine learning APIs such as Cloud Vision API and Cloud
  - Natural Language API.
- Activities
  - 1 quiz

## Using Cloud Functions for Event-Driven Processing

- • Key concepts such as triggers, background functions, HTTP functions
- • Use cases
- • Developing and deploying functions
- • Logging, error reporting, and monitoring
- • Demo: Invoke Cloud Functions Through Direct Request-response
- • Lab: Processing Pub/Sub Data using Cloud Functions
- Objectives



- Use Cloud Functions for event-driven processing.

- Activities

- 1 demo, 1 lab, and 1 quiz

## Managing APIs with Cloud Endpoints

- • Open API deployment configuration
- • Lab: Deploying an API for the Quiz Application
- Objectives
  - Understand OpenAPI deployment configuration.
- Activities

## Deploying Applications

- • Creating and storing container images
- • Repeatable deployments with deployment configuration and templates
- • Demo: Exploring Cloud Build and Cloud Container Registry
- • Lab: Deploying the Application into Kubernetes Engine
- Objectives
  - • Understand how to create and store container images.
  - • Create repeatable deployments with deployment configuration and templates.
- Activities

## Compute Options for Your Application

- Considerations for choosing a compute option for your application or service:
  - • Compute Engine
  - • Google Kubernetes Engine (GKE)
  - • Cloud Run
  - • Cloud Functions



- • Platform comparisons.
- • Comparing App Engine and Cloud Run
- Objectives
  - Explore considerations for choosing a compute option for your application or service.
- Activities
  - 1 quiz

## Debugging, Monitoring, and Tuning Performance

- • Google Cloud's operations suite
- • Managing performance
- • Lab: Debugging Application Errors
- • Logging
- • Monitoring and tuning performance
- • Identifying and troubleshooting performance issues
- • Lab: Harnessing Cloud Trace and Cloud Monitoring
- Objectives
  - • Debug an application error by using Cloud Debugger and Error Reporting.
  - • Use Cloud Monitoring and Cloud Trace to trace a request across services, observe, and optimize performance.
- Activities
  - 1 demo, 2 labs and 1 quiz